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मानक

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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 8271-2-21 (1985): Quartz Crystal Units Used for Frequency Control and Selection, Part 2: Series AA for Oscillators, Section 21: Quartz Crystal Unit Type AA-21 [LITD 5: Semiconductor and Other Electronic Components and Devices]



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“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard



SPECIFICATION FOR QUARTZ CRYSTAL UNITS USED FOR
FREQUENCY CONTROL AND SELECTION

PART 2 SERIES AA FOR OSCILLATORS

Section 21 Quartz Crystal Unit Type AA-21

0. General — This standard shall be read in conjunction with IS : 8271 (Part 1)-1981 'Specification for quartz crystal units used for frequency control and selection: Part 1 General requirements and tests (first revision)'.

1. Outline and Dimensions — Holder outline shall conform to type AA [See IS : 4570 (Part 2)-1983 Specification for crystal unit holders: Part 2 Metal, solder seal, two pin crystal unit holder, types AA and AB].

2. Marking — See 8 of IS : 8271 (Part 1)-1981.

3. Construction and Workmanship — See 7 of IS : 8271 (Part 1)-1981.

4. Test Schedule and Detail Requirements

4.1 General Conditions for Test — See 9.2 of IS : 8271 (Part 1)-1981.

4.2 Test Schedule — The sequence and grouping of type, routine and acceptance tests shall be as specified in 9.1 of IS : 8271 (Part 1)-1981.

4.3 Detail Requirements — The detail requirements applicable to this particular type of crystal unit shall be as specified in Table 1.

TABLE 1 DETAIL REQUIREMENTS OF QUARTZ CRYSTAL UNITS TYPE AA-21

SI No.	Characteristics	Requirements	
(1)	(2)	(3)	
i)	Type of holder	AA (See 1)	
ii)	Frequency range	0.8 to 20 MHz	
iii)	Frequency tolerance:		
	a) Operating temperature range	± 20 ppm	
	b) Room temperature	± 80 ppm	
iv)	Frequency stability	± 5 ppm	
v)	Load capacitance	32.0 ± 0.5 pF	
vi)	Mode of oscillation	Fundamental	
vii)	Reference temperature	85 ± 1°C	
viii)	Temperature range:		
	a) Operating	80 to 90°C	
	b) Operable	-55 to + 80°C	
ix)	Test set, calibration values and rated drive level	See Table 2	
x)	Capacitance shunt	7 pF (Max)	
xi)	Resonance resistance	See Table 3	
xii)	Shock [As per 9.15 (Severity A) of IS : 8271-1981]		
	a) Frequency change permitted	± 5 ppm	
	b) Resonance resistance change permitted	Below 2 MHz	2 MHz and above
		±15 percent	±10 percent
xiii)	Vibration [As per 9.16.1 (Severity A) of IS : 8271-1981]		
	a) Frequency change permitted	± 5 ppm	
	b) Resonance resistance change permitted	Below 2 MHz	2 MHz and above
		±15 percent	±10 percent
xiv)	Temperature cycling:		
	a) Frequency change permitted	±5 ppm	
	b) Resonance resistance change permitted	Below 2 MHz	2 MHz and above
		±15 percent	±10 percent
xv)	Ageing:		
	Frequency change permitted	5 ppm	

TABLE 2 TEST SET, CALIBRATION VALUES AND RATED DRIVE LEVEL

[Table 1 (SI No. ix)]

SI No.	Frequency Range	Calibration Values			Rated Drive Level	Test Set
		Resistance	Crystal Current	Resistor Voltage Drop		
(1)	(2) MHz	(3) ohms	(4) mA	(5) V	(6) mW	(7)
i)	From 0.8 to 1.5	0	*	—	5.0 ± 1.0†	TS-330/TSM
ii)	Over 1.5 to 2.25	50	10	—	5.0 ± 1.0	
iii)	Over 2.25 to 3.4	50	10	—	5.0 ± 1.0	
iv)	Over 3.4 to 5.1	22	15	—	5.0 ± 1.0	
v)	Over 5.1 to 7.5	13	20	—	5.0 ± 1.0	
vi)	Over 7.5 to 10	13	20	—	5.0 ± 1.0	TS-683/TSM
vii)	Over 10 to 15	11	15	—	2.5 ± 0.5	
viii)	Over 15 to 20	10	—	0.16	2.5 ± 0.5	

*Set crystal current control at extreme counter clockwise (minimum) position.

†The violation of $P = I^2R$ is intentional; at the higher resistance of the crystal unit, the empirical power dissipation will be as rated.**TABLE 3 RESONANCE RESISTANCE**

[Table 1 (SI No. xi)]

Frequency Range	Maximum Resistance
(1) MHz	(2) ohms
From 0.8 to 0.85	620
Over 0.85 to 0.9	600
Over 0.9 to 1	570
Over 1 to 1.12	540
Over 1.12 to 1.25	490
Over 1.25 to 1.37	450
Over 1.37 to 1.5	410
Over 1.5 to 1.62	370
Over 1.62 to 1.75	330
Over 1.75 to 1.87	300
Over 1.87 to 2	290
Over 2 to 2.12	270
Over 2.12 to 2.25	240
Over 2.25 to 2.6	190
Over 2.6 to 3	150
Over 3 to 3.4	110
Over 3.4 to 3.75	90
Over 3.75 to 4	75
Over 4 to 5	60
Over 5 to 7	35
Over 7 to 10	24
Over 10 to 15	22
Over 15 to 20	20

EXPLANATORY NOTE

This standard covers the requirements of crystal unit, quartz, style QC-18 of JSS 50905 (1971) 'Detail specification for crystal unit, quartz style QC-10, QC-11, QC-14, QC-15, QC-16, QC-17, QC-18 and QC-19 issued by the Directorate of Standardization, Ministry of Defence (India).